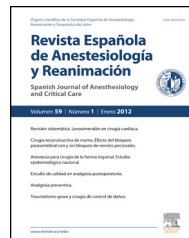




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ORIGINAL ARTICLE

Epidural anesthesia: Simulated intravascular test dose with S(+) ketamine, lidocaine and adrenaline. A prospective, randomized, double blind and placebo controlled study[☆]

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Epidural anesthesia;
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Lidocaine;
Adrenaline;
Ketamine;
Randomized, placebo
controlled, double
blind study

Abstract

Objective: The use of a test dose in epidural anesthesia is a safety recommendation. However, specificity and sensitivity of the drugs used with this indication have not been conclusive. The main objective of this study was to compare the effectiveness and the adverse effects of a simulated intravascular test dose of adrenaline, lidocaine and S(+)-ketamine.

Material and methods: A prospective, randomized, double blinded, placebo controlled study was designed. ASA I patients scheduled for elective surgery were included. These were randomized to the following study groups: S(+)-ketamine 0.5 mg kg⁻¹ (S+K group), 5% lidocaine 1.5 mg kg⁻¹ (L5% group), adrenaline 15 µg (ADR group), and physiological saline 3 ml (SF group; control group).

An evaluation was made during the first 15 min after the study drug was administered. Variables including heart rate (HR) systolic and diastolic blood pressure (sBP and dBP), mean arterial pressure (MAP), and SpO₂ were recorded at 0 min (baseline) and at 2, 5, 8, 10 and 15 min after drug injection. An increase of at least 20 beats per minute (bpm) in relation to the baseline measurement was considered a positive result, as was an increase sBP >15 mm Hg. The clinical effects described as related to iv injection of the study drugs recorded were sedation-hypnosis, dizziness, nystagmus, metallic taste perception, perioral or facial paresthesias, tinnitus, as well as any other effect the patients mentioned. Sensitivity and specificity were calculated as was the percent increase in the parameters in order to see if these were clinically useful.

Results: A total of 80 patients, 20 per group, were included. The sBP, dBP, and MAP were significantly raised at the 2, 5, 8 and 10 min measurements in the S(+)-K group compared to the rest of the groups ($p < .05$), as well as HR in the 2, 5, 8, 10 and 15-min measurements in the S(+)-K compared to the rest of the groups ($p < .05$).

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Sensitivity and specificity were high, and significant in the S(+)K group from minute 2 to minute 8 compared with the placebo group, as well as percentage points differences in the same interval.

There were significant differences in the incidence of sedation-hypnosis, nystagmus and dizziness, which were more frequent in the S(+)K group. There were no differences in the incidence of metallic taste, perioral and facial paresthesias or tinnitus. The effects in the S(+)K group always occurred before minute 5 after drug injection.

Conclusion: Both lidocaine and adrenaline at the scheduled doses showed low sensitivity and specificity as a simulated IV epidural test dose. S(+)-ketamine could be a feasible marker after accidental iv injection during epidural anesthesia or analgesia.

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PALABRAS CLAVE

Anestesia epidural;
Analgesia epidural;
Dosis test;
Lidocaína;
Adrenalina;
Ketamina;
Estudio aleatorizado,
controlado, doble
ciego

Anestesia epidural: dosis test intravascular simulada con S(+)-ketamina, lidocaína y adrenalina. Estudio prospectivo, aleatorizado, doble ciego, controlado con placebo

Resumen

Objetivo: La dosis test en anestesia epidural es una recomendación de seguridad. La especificidad y sensibilidad de los fármacos empleados no ha resultado concluyente. Nuestro objetivo fue comparar la efectividad de adrenalina, lidocaína y S(+)-ketamina como dosis test intravascular simulada, así como sus efectos adversos.

Material y métodos: Estudio prospectivo, aleatorizado, doble ciego, controlado con placebo. Pacientes ASA I, sometidos a cirugía electiva. Los grupos de estudio fueron (asignación aleatoria): S(+)-ketamina 0,5 mg/kg⁻¹ (grupo S + K), lidocaína 5% 1,5 mg/kg⁻¹ (grupo L5%), adrenalina 15 µg (grupo ADR) y suero fisiológico 3 ml (grupo SF; grupo control).

Se evaluaron los primeros 15 min tras la administración del fármaco. Se evaluó: FC, PAS, PAM, PAD y SpO₂ a los 0 min (basal) y a los 2, 5, 8, 10 y 15 min de la inyección del fármaco de estudio. Se consideró positivo un incremento de al menos 20 lat/min respecto de la determinación basal, o un incremento de la PAS > 15 mm Hg. Se registraron efectos clínicos: aparición de sedación-hipnosis, mareo, nistagmo, percepción de sabor metálico, parestesias faciales o peribucles, tinnitus, así como cualquier otro efecto referido por los pacientes. Se calculó la sensibilidad y especificidad y la diferencia porcentual de la variación para comprobar su significación clínica. **Resultados:** Fueron incluidos 80 pacientes, 20 por grupo. Se encontraron diferencias significativas en la PAS, PAM y PAD que se incrementaron a los 2, 5, 8 y 10 min entre el grupo S(+)-K y los otros 3 grupos (p < 0,05), así como en la FC a los 2, 5, 8, 10 y 15 min entre el grupo S(+)-K y el resto (p < 0,05).

La sensibilidad y especificidad fueron altas y significativas en el grupo S(+)-K comparada con placebo desde el minuto 2 al 8, así como la diferencia porcentual en ese mismo intervalo.

Hubo diferencias significativas en la incidencia de sedación-sueño, nistagmo y mareo, que fue mayor en el grupo S(+)-K, pero no las hubo en la incidencia de sabor metálico, parestesias peribucles o tinnitus. Los efectos detectados en el grupo S(+)-K aparecieron siempre antes de los 5 min de inyectado el fármaco.

Conclusión: Tanto lidocaína como adrenalina a las dosis empleadas presentaron escasa sensibilidad y especificidad como dosis test epidural intravascular simulada. S(+)-ketamina es un posible marcador de una inyección accidental intravascular.

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Introduction

Epidural anesthesia and analgesia are widely used. To guarantee safety and avoid the complications associated with the procedure, a test dose consisting in the administration of a

small dose of a local anesthetic (or the use of a procedure or technique) allows surgeons to detect incorrect placement of the needle or catheter.¹⁻⁴

The epidural space contains blood vessels, epidural veins and arteries. The blood vessels, which are part of the

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